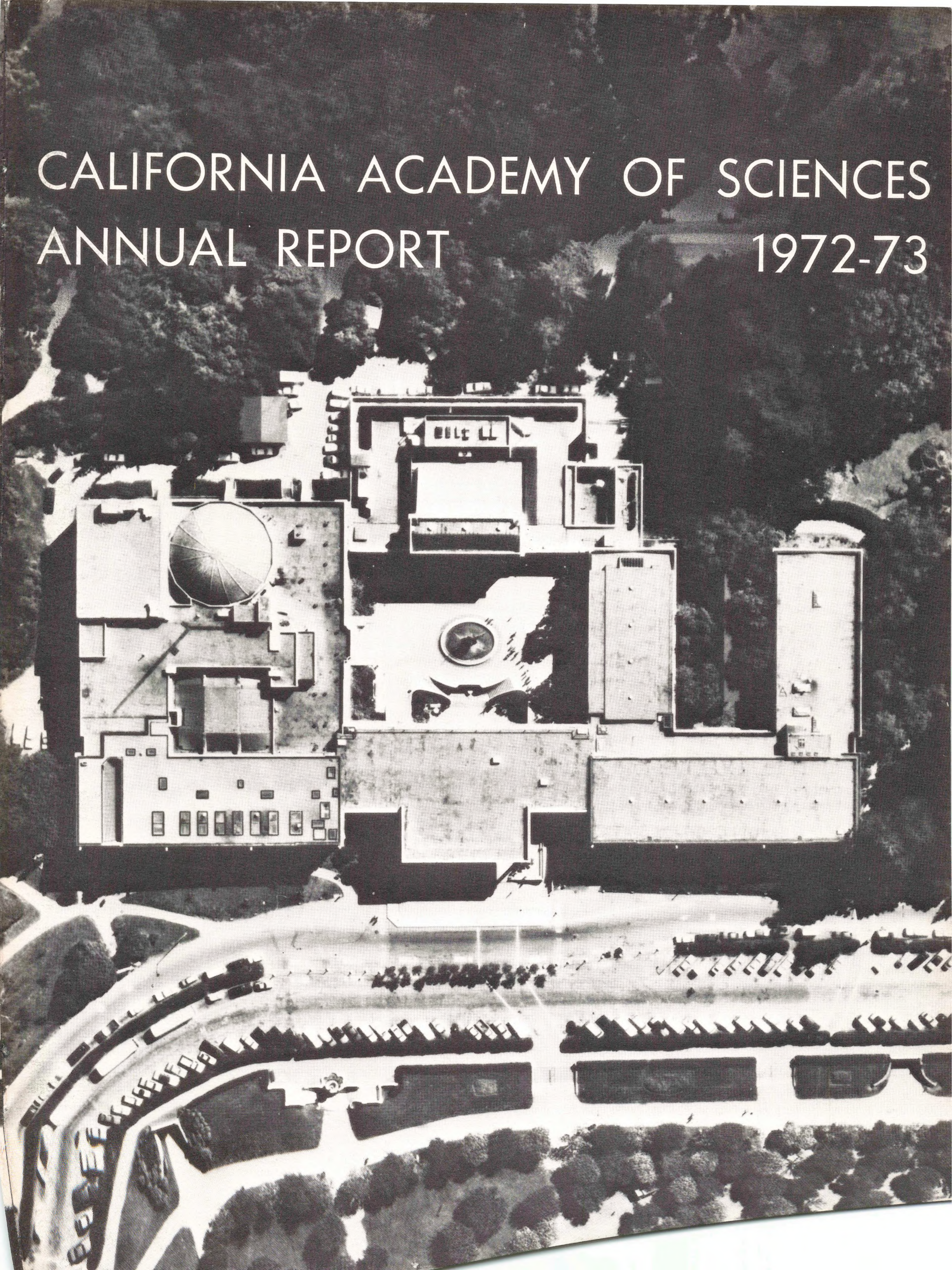
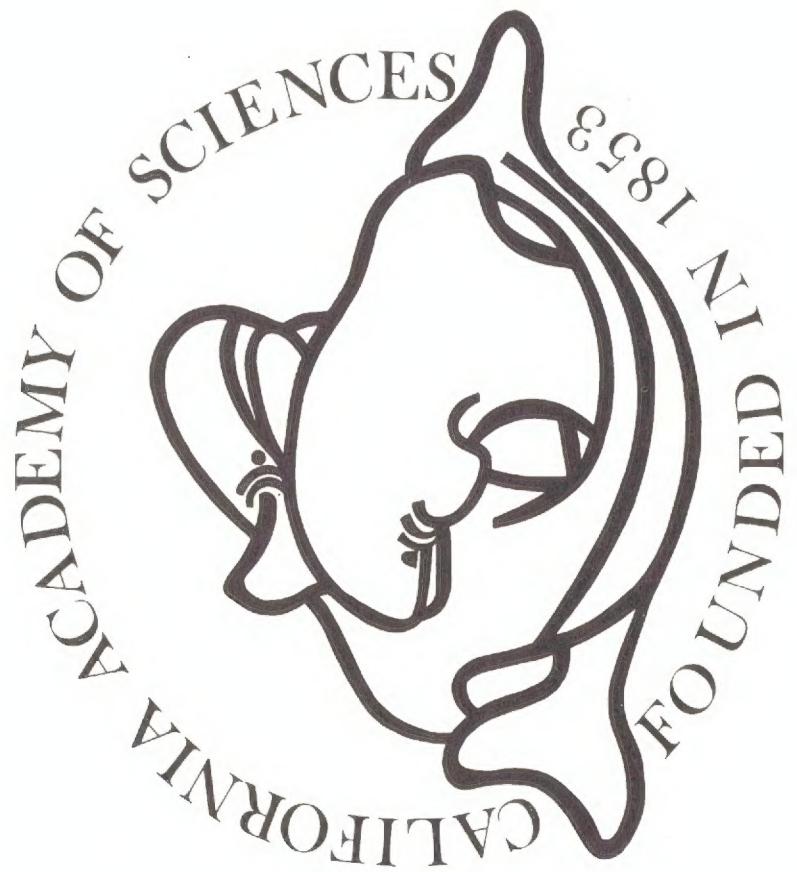
CALIFORNIA ACADEMY OF SCIENCES
ANNUAL REPORT 1972-73




CALIFORNIA ACADEMY OF SCIENCES
FOUNDED IN 1853

CALIFORNIA ACADEMY OF SCIENCES
ANNUAL REPORT 1972-73

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CALIFORNIA ACADEMY OF SCIENCES
GOLDEN GATE PARK, SAN FRANCISCO, CALIFORNIA 94118

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*Resigned March 22, 1973.

Architects' sketch of the additions which will replace the present service area of the Academy. At the left is the Meyer Fish Roundabout, adjacent to Steinhart Aquarium; center, the new entrance and exhibition gallery which will provide public access from Middle Drive and the Sunset district; right, the Wattis Hall of Man, with an exhibit floor for anthropology, concealed underground parking and service facilities, and space for the botany and entomology collections. Inconspicuous curved service drives and improved landscaping will enhance the appearance of the park and the Academy.

A MESSAGE FROM THE CHAIRMAN

DURING the past few months the staff of the California Academy of Sciences was involved with a series of time-consuming delays in gaining the final approvals for construction of the Wattis Hall of Man and the Meyer Fish Roundabout. This caused the preparation of the Annual Report for the fiscal year June 1972-1973 to be held up until December.

The goods news of this delayed annual report is that the contract for the new additions was let in December and construction has started. Thus, 1973 must be viewed as a red-letter year in the 121-year history of the California Academy of Sciences. We will now have a splendid museum for anthropological exhibits. There will be two floors above the Museum providing much needed space for expanding research departments. One will be for the Entomology Department and one for the Botany Department.

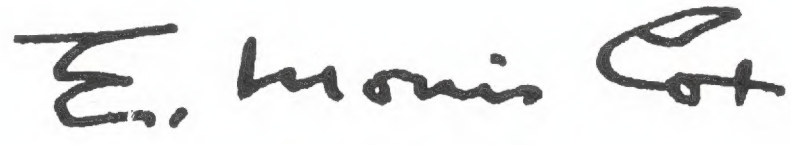
At the turn of the century the Academy was developing an Anthropology Department in its original building on Market Street with a young curator, Alfred Kroeber. Kroeber moved on from the Academy to become the moving force of the emerging Anthropology Department of the University of California in Berkeley. He was one of the many distinguished faculty members attracted to Berkeley by the then President, Benjamin Ide Wheeler. The fire of 1906, which destroyed the Academy, destroyed the anthropology collections and we have ever since been without an Anthropology museum.

Those of you who visit the Smithsonian Institution in Washington and the American Museum of Natural History in New York have seen their splendid anthropology exhibits and can appreciate their educational value for young students. Hundreds of thousands of school children visit the Academy each year and our educational role for them will be greatly enhanced. We will now be a truly complete museum of natural history. With the addition of the Anthropology Department in our 122nd year one may say the Academy has reached maturity.

The new Fish Roundabout for the aquarium will be unique in the United States and a major Academy and San Francisco attraction. It will enable the aquarium to expand its exhibits to include a great variety of free-swimming open-ocean fishes which cannot be confined in the usual aquarium tanks. The roundabout will be the most spectacular and important addition in the aquarium history.

During the fiscal year 1972-1973 we welcomed to the Board of Trustees Mr. Sherman Chickering, Dr. John Hensill, Mr. George F. Jewett, Jr., and Richard K. Miller. Because of the delay of the fiscal 1973 report we would like to mention that at the October 1973 meeting three new Trustees were elected. They are Mr. Thad Brown, Mr. Otto N. Miller and Mrs. Paul L. Wattis.

At the November meeting the Board elected Jeffery W. Meyer to succeed his late father, Wilson Meyer, a major benefactor and trustee who served the Academy with great devotion over a long period of years. At the same meeting I completed six years as chairman of the Academy. My successor is Mr. Paul L. Davies, Jr. He has served the Academy as treasurer and brings great strength and devotion to the Academy's needs.



E. MORRIS COX
Chairman, Board of Trustees

REPORT OF THE DIRECTOR

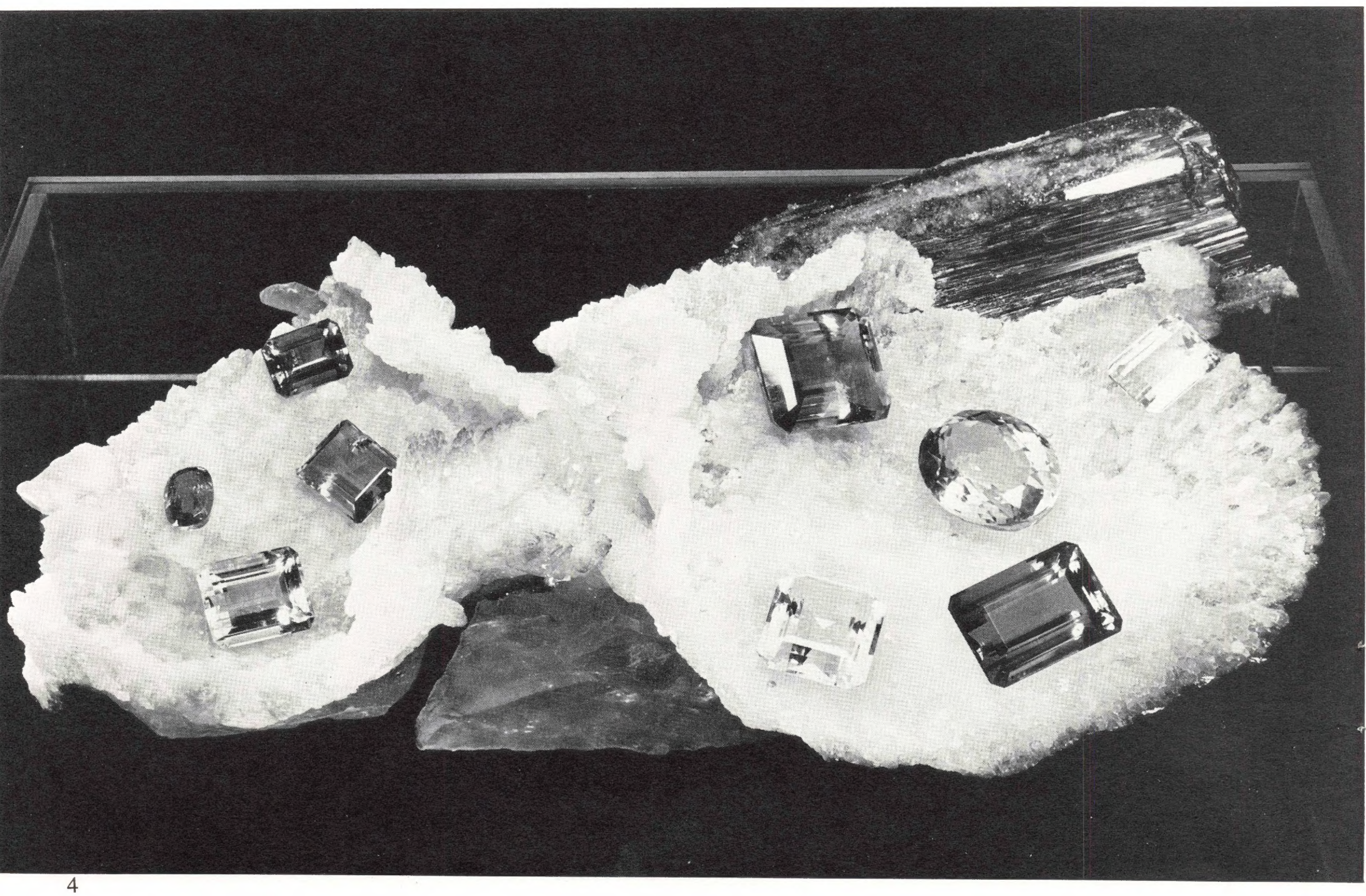
THE California Academy of Sciences had 1,307,923 visitors during the year. Of these 568,132 came in school class groups or were otherwise admitted free of charge, while 611,895 adults paid fifty cents and 127,896 youths paid twenty-five cents for their admissions.

This was a year of anticipation and expectation. Architects and engineers developed the plans for the Wattis Hall of Man and the Meyer Fish Roundabout, which were approved by the Recreation and Park, Art, and Planning Commissions. It was a year of looking to the future, but there were glances back at the past as well. Morrison Planetarium celebrated its 20th anniversary, and Steinhart Aquarium prepared for its 50th.

STEINHART AQUARIUM

William N. Eschmeyer, Acting Superintendent. Earl S. Herald, who directed Steinhart Aquarium for twenty-five years, died while diving at Cabo San Lucas, Baja California, on January 16, 1973. Dr. Herald's dedication and enthusiasm made Steinhart one of the great aquariums of the world. He was a productive research scientist and writer, with an unusual talent for popularizing science.

Dr. Eschmeyer, Chairman of the Ichthyology Department, served as Acting Superintendent through the remainder of the fiscal year, while Robert P. Dempster, Curator, and Senior Aquatic Biologist Glenn E. Burghardt



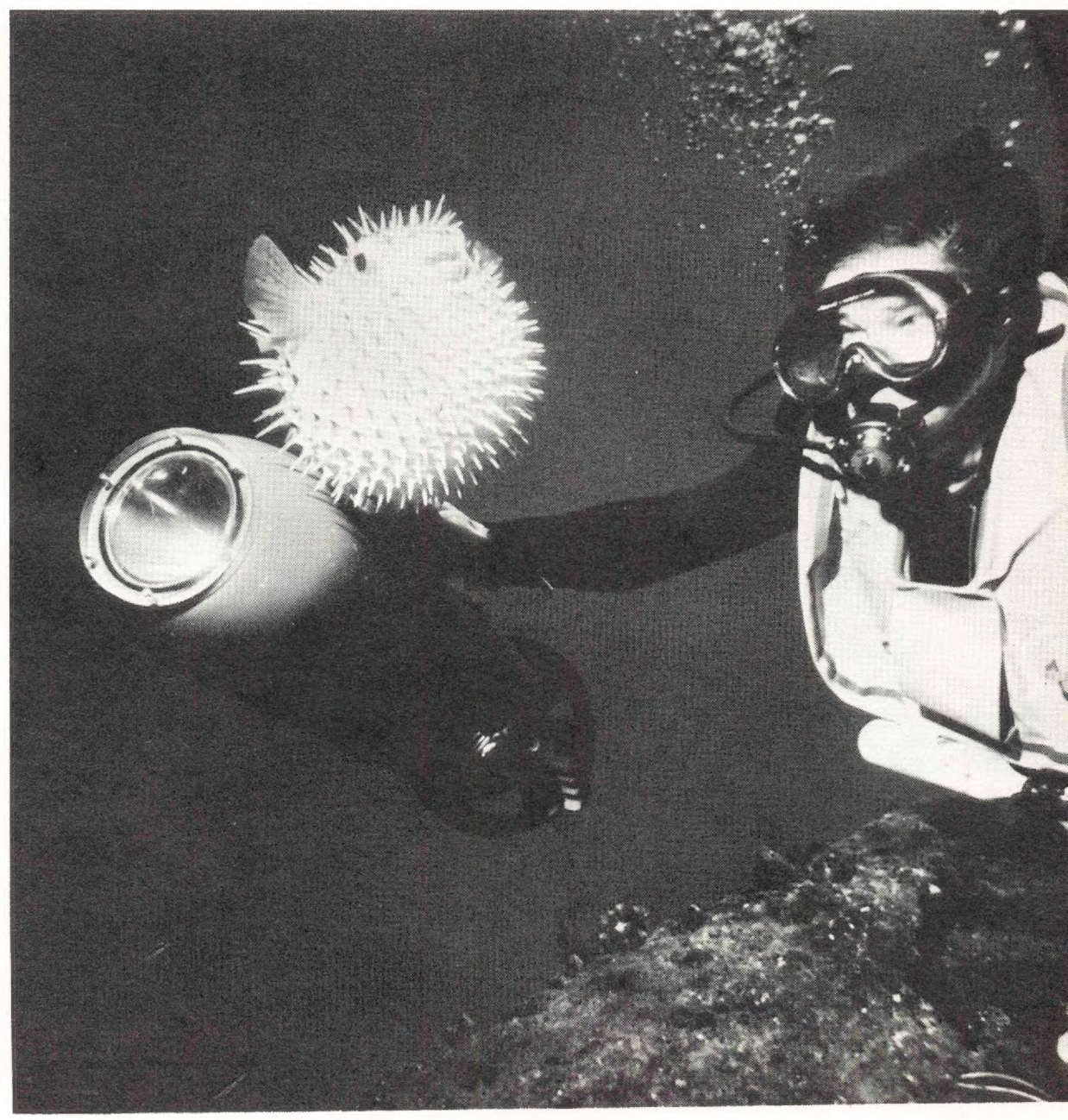
Facing page: a new Gem Room features spectacular gems and minerals, most of which were donated by Mr. and Mrs. Lewis K. Land. Left, Director George Lindsay, Mrs. Paul L. Wattis, and Chairman E. Morris Cox on the occasion of the announcement of the Paul L. and Phyllis Wattis Foundation's gift of $1 million for the Hall of Man. Below, Dr. Earl S. Herald, whose energetic and resourceful management of Steinhart Aquarium for twenty-five years resulted in its worldwide reputation for excellence.

saw to the efficient day-to-day management of the facility. A nationwide search for Dr. Herald's successor was undertaken and Dr. John E. McCosker was selected to become Acting Superintendent effective September 1, 1973.

Much staff time and effort went into the planning of the Meyer Fish Roundabout, which will be provided by the G. H. C. Meyer Family Foundation, of which Trustee Wilson Meyer was president. In late February, Dr. and Mrs. Lindsay and architect William Hutchison journeyed to Japan to study the donut-shaped tanks at the Keikyo Aburatsubo Marine Park and the Shima Marineland. Complete technical engineering information was provided by the directors and staffs of both institutions, answering complex questions about the Academy's roundabout tank which will be the first in the United States.

During the year 25,612 live specimens were accessioned by the aquarium, of which 1,829 were purchased, 3,775 were gifts, 545 were received in exchange, and 19,463 were collected. Steinhart Divers, an informal support group of the aquarium, continued their collecting and made special trips to the Kona coast of Hawaii and the Gulf of California for specimens. Locally, Captain Ron Polse provided many wild-caught chinook salmon and Fred Miller and his family caught two large sturgeons for the aquarium.

Steinhart Aquarium is the largest department of the



Academy. It receives substantial financial support from the City and County of San Francisco for its operation, which requires the twenty-four hour attention of highly trained biologists, aquarists, and engineers.

MORRISON PLANETARIUM

Robert D. Risser, Supervisor. There were 945 presentations of seven public shows during the year, attended by 140,664 people, and 124 student shows which were attended by 34,541, for a total of 1069 performances which were viewed by 175,205 people. In addition, 107 persons took the courses offered in celestial navigation, 77 enrolled in the "Astronomy for Fun" course, 69 for telescope making, and 126 took the Junior Academy summer course in astronomy.

November 6, 1973 was the 20th anniversary for the dedication of Morrison Planetarium. This fine facility was built with private funds. It is not only self-sustaining but provides income for general Academy operations, and it has served nearly four million people. Morrison is one of the few major planetariums which receives no tax fund support. It is an important educational facility of the community.

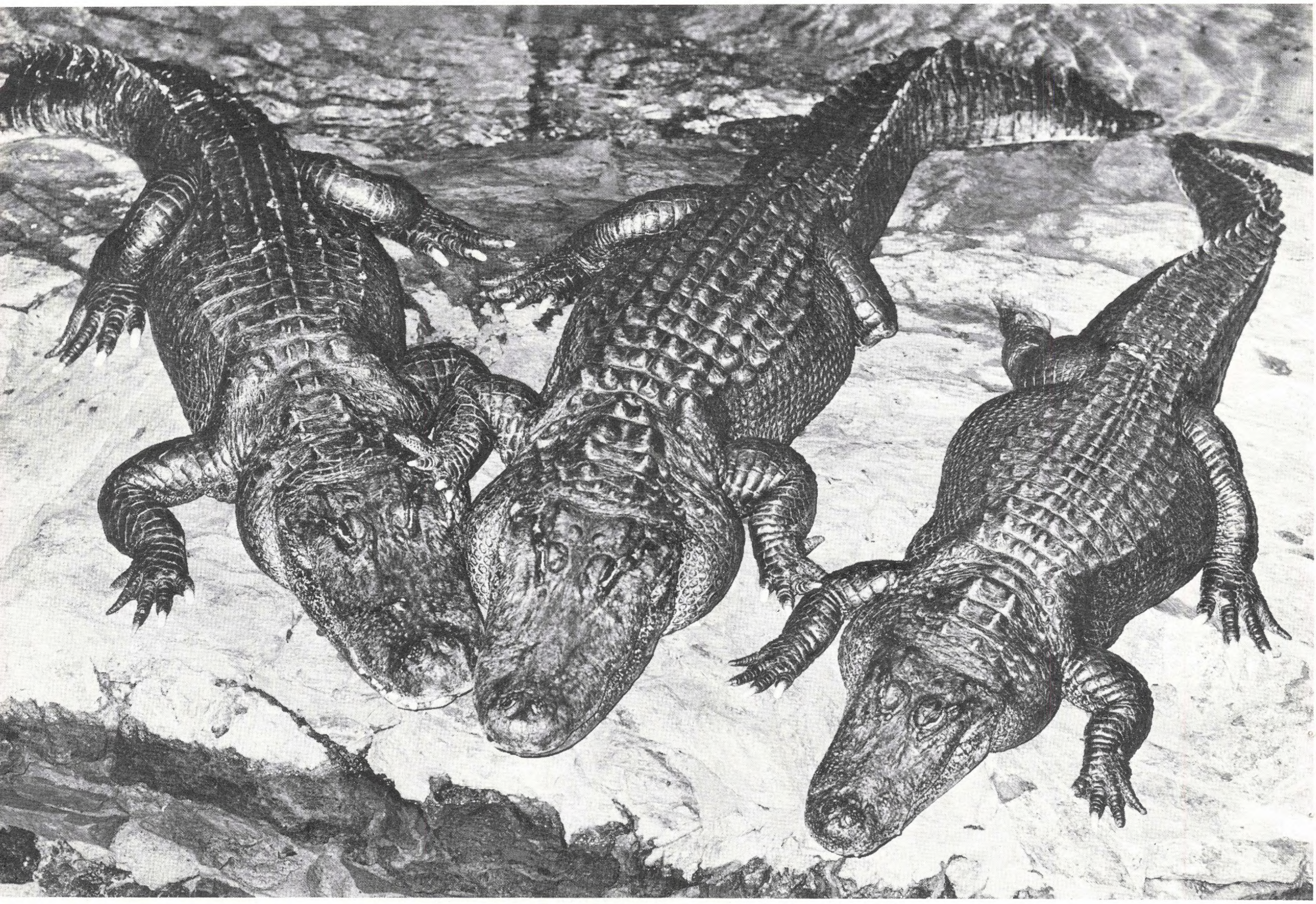
JUNIOR ACADEMY

Kenneth E. Lucas, Supervisor. The California Junior Academy of Sciences had 452 members, for whom twenty-six courses were offered during the year. These ranged from "Nature Study" to "Chemistry," and some included field trips and research projects.

Three Junior Academy members—Brian McCaffery, Robert Nelson, and Guy McGuinnes — were awarded American Association for the Advancement of Science research grants to enable them to pursue original research.

Academy staff scientists presented courses for Junior Academy members, and the planetarium staff gave a course, "Practical Observational Astronomy," for the Junior Academy members and their parents.

Mr. Lucas provided services and facilities for many visiting public and private school class groups; and the Junior Academy facilities, which were recently modernized and augmented through a grant from the San Francisco Foundation, were used by many groups during the year.



American alligators remain a popular attraction to numerous visitors in Steinhart Aquarium.

Left, Dr. Robert T. Orr, Associate Director of the Academy, directed and presented the Basic Training Course for the Docent Council. Thirty well-trained docents graduated in April. Below, astronomer Leon Salanave and Senior Scientist and former Academy Director Dr. Robert C. Miller inspect projectors manufactured in the instrument shop. These were exhibited as part of the 20th anniversary celebration of the Alexander F. Morrison Planetarium on November 6, 1973.

DOCENT COUNCIL

Mrs. Thomas Pickford, Chairman, and Diane Butler, Secretary-Coordinator. The Docent Council had 110 active volunteers, who conducted tours for 10,005 students and other individuals, and in-school volunteers who took Academy exhibits to San Francisco classrooms. The docents also served as hostesses at Academy functions and the annual Open House.

The Administrative Committee of the Council, which planned and supervised the activities of the volunteer program, consisted of Mmes. Thomas Pickford, James Mailliard, Robert Dunne, Roy Borgonovo, Max Janoff, Willard Norberg, Thomas Curran, Michael Schirmer, Thomas Malarkey, Ernest Goodner, Ernest Lilienthal, Roland Perkins, Rex Butler; Miss Vivienne Hock, Mr. Fred Hilmer, and Dr. Robert T. Orr.

The Basic Training Course committee, led by Mrs. Roy Borgonovo and Mrs. Max Janoff, worked closely with Dr. Orr, who directed and presented the course with assistance from other Academy scientists. Thirty well-trained docents graduated in April. Continuing Education Chairman Mrs. Thomas Curran and Field Trip Chairman Mrs. Ernest Goodner arranged many seminars, lectures, and field trips. TOURisms, the Council's informative newsletter, was edited by Mr. Fred Hilmer.

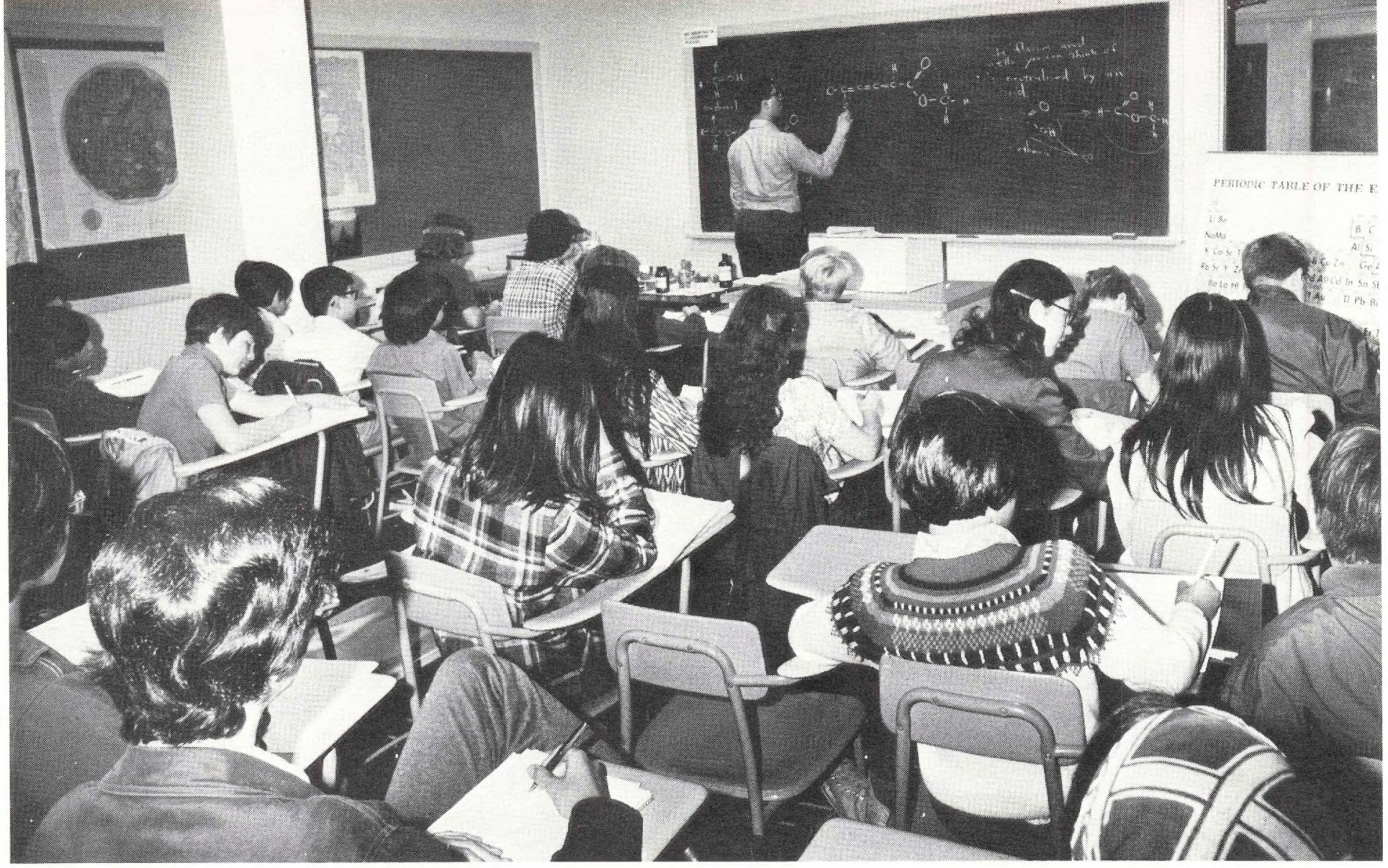
In lieu of a fund-raising event this year, the council sponsored the Academy's annual Christmas party, in appreciation of the professional staff's cooperation which had insured the success of the docent program.

J. W. MAILLIARD, JR. LIBRARY

Ray Brian, Librarian. Mr. Brian has served as Academy Librarian for ten years, and his report for 1972-73 reviews the accomplishments of that decade as well as the frustration caused by increasing book and serial costs, increasing demands for service, and insufficient funds to provide the salaries and materials he feels are essential.

The Mailliard Library is the central literature repository for the Academy, and is also headquarters for the branch libraries located in each of the research departments. The Academy's library resources are available for use by the broad scientific community. The library also manages the exchange of Academy scientific publications with 612 other institutions.

During the year 367 books were purchased for $6,456.12, and 364 serials and 51 monographs were purchased for $8,232.59. Through exchanges and gifts, 1,783 additional serial titles were acquired. During the year 537 requests for interlibrary loans were received from 151 other institutions, of which 343 could be accommodated. At the same time, Academy scientists made 90 requests for interlibrary loans, 59 of which were served by the University of California, Berkeley.



Right, twenty-six courses in the life, earth, astronomical, and physical sciences were offered members of the Junior Academy. Here, instructor Mark S. Ghiorso lectures to a class studying chemistry. Below, living animals and the life and environmental studies hold the attention of most Junior Academy members.

PICTURE COLLECTION

Johan Kooy, Chairman. Well over a million photographs, negatives, slides, prints, and art works are catalogued and made available for study, exhibit, and publication through the Academy's picture collection. This department is in its tenth anniversary year and the conscientious work of many volunteer assistants has brought order to the Academy's long accumulation of historical photographs, prints, and original art works relating to natural history.

Among those who made generous gifts to the department during the year were Mr. and Mrs. S. D. Bechtel, Jr., Mr. Henry Evans, Mr. and Mrs. J. E. McClellan, and Mrs. Margaret Gregory. Notable among other gifts were the fine photographs of orchidaceous plants of Frithjof Holmboe given by Mr. and Mrs. Thoralf Holmboe, Mr. Chester Cramer's western native plant photographs given by Mrs. Cramer, and the glass plates and photographic prints recording the Gifford Pinchot South Seas Expedition of 1929 given by Mr. Howard Cleaves. This important donation was arranged by Mrs. Roger Tory Peterson, who personally drove across the country with it to avoid damage in shipment.

The continued financial support of Mr. Paul Anderson, Miss Muriel French, and Mrs. Helen Peterson was important to the department. Volunteers staff the Picture Collection and special appreciation is due Mr. Anderson, Miss French, Mrs. Frances Iden, Mrs. Roberta Long, and Mrs. Marian Boede.

PACIFIC DISCOVERY

Bruce Finson, Editor. The Academy's attractive nature magazine appears six times each year, and features articles about man and his environment. Frequently the stories report the research or experiences of staff scientists.

Johan Kooy is Art Director, George Lindsay is Managing Editor, and Robert I. Bowman, Robert C. Miller, and Robert T. Orr are Associate Editors. Mr. Finson also edits the Annual Report, and Mr. Kooy is responsible for its graphic design.

This year Bruce Finson was the author of a 32-page guide to the Academy of which Johan Kooy was Art Director. It featured all color illustrations of representative exhibits photographed by Lloyd Ullberg and other staff members.

EXHIBITS

Ernest R. Rook, Chairman and Curator. A new Gem Room was opened—it is a room-sized vault for the display of spectacular gems and minerals, most of which were donated by Mr. and Mrs. L. K. Land. Robert Bjorkland was responsible for the dramatic exhibition of the speci-

mens, and also credited for a new quartz, opal, and tourmaline mine exhibit in Mineral Hall.

In Cowell Hall an exhibit titled "Cetacea" was designed by Richard Cook, featuring models of the great whales and dolphins by Jerry F. Glover.

Temporary shows included the wood sculpture of Peter and Wheatley Allen; paintings of African people by Joy Adamson; photographic exhibits by Martin Scweitzer, Lloyd Ullberg, and Bernard Blake; a show of southwest Indian artifacts selected from the Charles and Ruth de Y. Elkus collection; plants, specimens, and photographs from the San Bruno Mountain flora; a special show of instruments and historical photographs for the planetarium's 20th birthday, and an exhibition featuring the Golden Gate National Recreation Area. The special exhibition at the year's end was Nancy Bechtel's fine color photographs of East African wildlife and people.

The important Indian and Eskimo collection of Mr. and Mrs. Charles de Y. Elkus was given to the Academy and is temporarily in the custody of the Exhibits Department for accessioning and cataloging. Mrs. Painter Douglas was in charge of that project, which was well underway at the end of the year. The Elkus collection will be enormously important for the future Wattis Hall of Man exhibitions.

Mr. and Mrs. Sidney Garfield established a fund for an exhibit on the African Origins of Man, which was in preparation.

Many volunteers assisted in all areas of exhibit preparation and archaeological restorative work.

INSTRUMENT SHOP

Steven B. Craig, Superintendent. Instrument shop personnel provided services to all departments of the Academy. Special effects projectors were designed and built for the planetarium, as was equipment for the aquarium, the Delta Mendota Canal project, and the Exhibits Department. Electrical installations, security systems, and printing services are the responsibility of the shop personnel. Added duties during the past year included working with architects and engineers, and approving the plans and specifications for the new buildings.

PUBLIC INFORMATION

Hal Richardson, Public Information Officer. The current happenings and activities of the Academy are of interest to its members as well as to the public at large. It is Mr. Richardson's responsibility to make them known through the local media—radio, television, press—all of which are generous in relaying that information gratis.

He also wrote and oversaw the production of the monthly Academy Newsletter, and assisted outside writers with their special assignments. Arrangements for monthly meetings are Mr. Richardson's responsibility, as is the column "Academically Speaking" in *Pacific Discovery*.

Mrs. Walter Buchen and Mrs. Grace Curtis, as volunteers, generously maintained the press books.

DEVELOPMENT AND MEMBERSHIP

Mrs. Kathleen F. Bowman, Development Officer. The Development and Membership office encourages corporate, foundation, and individual financial support which is essential for the operation of the Academy, and provides staff assistance for the Trustees committees which are concerned with these activities. Mr. Frank Hayward chaired

Above right, sculptor Jerry F. Glover prepared models for the marine mammal exhibit, "Cetacea," which was completed for Cowell Hall. Above, a selection from the important Indian and Eskimo artifact collection of Mr. and Mrs. Charles de Young Elkus was exhibited. The Elkus collection, one of the most important of its kind, was given to the Academy and will be featured in the Hall of Man.

the Corporate Support Committee, Mr. John A. Sutro the Friends Committee, and Mrs. Ernest Lilienthal the Membership Committee.

On July 1, 1972 there were 6,695 adult and 514 junior members. On July 1, 1973 there were 7,456 adult and 452 junior members.

The travel program for members, which was directed by volunteer Mrs. George Lindsay, was operated through the Development and Membership office. Trips included a charter flight to Rome; four tours which took 90 members to East Africa; a cruise to Guadalupe Island and Scammons Lagoon, Baja California; one four-day charter bus trip to Bodie, the bristlecone pine forests, and the Yosemite region; a trip to Redwood National Park; and local walks and day trips. Academy personnel led the excursions.

RESEARCH ACTIVITIES

Basic research in the life, earth, and environmental sciences; the publication of results of that research; the maintenance of comprehensive systematic collections in various disciplines, readily available to all investigators; field exploration to discover new information; and laboratory investigation remain the primary purposes of the California Academy of Sciences. The Academy is one of the important research assets of our nation.

BOTANY

Elizabeth McClintock, Acting Chairman and Curator. During the year 7,006 plant specimens were mounted and on May 30, 1973 there were 564,506 specimens in the herbarium. In addition, the Ernest Twisselmann Herbarium of some 20,000 specimens was received as a bequest.

Assistant Curator Dennis Breedlove returned in May, 1973 from twenty months of field work in Chiapas, Mexico

Trips for Academy members explored far and near. Above, a picnic in Kenya for some of the 90 members who went to East Africa; right, a busload of members on a four-day excursion to see the bristlecone pines in the White Mountains of California.

in connection with his preparation of a flora of that state. Dr. McClintock participated in the Chiapas field work in March, continued a project to update her out-of-print report of woody ornamental plants of California, and began work on a book, *Poisonous Plants of California,* in collaboration with Dr. T. C. Fuller.

Curator John H. Thomas continued work on his *Central California Flora* and, with Dr. Dennis Parnell, wrote *Native Shrubs of the Sierra Nevada* for the University of California Press natural history guide series.

During the year 32 loans totaling 3582 specimens were made to other herbaria, and more than 1000 visitors came to the department seeking information.

ENTOMOLOGY

Paul H. Arnaud, Jr., Chairman and Curator. The insect collection contains 5,936,346 specimens, 159,346 having been accessioned during the year from gifts, expeditions, exchanges, purchases, and permanent loans.

During this report period 95,110 specimens were loaned in 363 transactions to 180 persons at 92 different institutions and to 27 private research workers who were not affiliated with institutions. Most of the specimens were borrowed by graduate students in the United States, but there were loans to research centers in England, Japan, Pakistan, India, Holland, Brazil, and other countries.

The National Science Foundation provided $42,800 for curatorial support and equipment for the department, in recognition of its services to the larger scientific community. Two technical assistants and half the salary of a curator were supported by this grant, which also provided funds for visiting specialists who aided in the curation of special sections of the collection, and for the purchase of twenty-four aluminum cases and 491 glass-topped specimen drawers.

Research activities included the publication of a major paper, "Types of Thysanoptera in the Collection of the California Academy of Sciences," by Arnaud and Lee. Dr. Arnaud studied types of American Tachinidae in Europe for two months, supported in part by a grant from the American Philosophical Society. Mr. Briggs (with Robert Leni) is preparing a revision of the harvestmen of the genus *Taracus*. Mr. Lee completed a revision of the littoral pseudoscorpions of Baja California as a thesis, and Carolyn Mullinex revised the genus *Paraphrynus* as a thesis. Mr. Herman Real continued work on the butterflies of Baja California as a Patterson Fellow. Dr. Ross continued work on his Embioptera monograph. Dr. Williams continued taxonomic and zoogeographical research on the Baja California and California scorpion fauna. Dr. Philip continued his ongoing studies of the Mexican Tabanidae. Field work was worldwide: Dr. Arnaud in Europe, Dr. Ross in Africa, Mr. Davies in New Guinea, and Mr. Patterson, Dr. Williams, Dr. Philip, Miss Mullinex, and Mr. Briggs in Baja California and other areas of Mexico.

The Department of Entomology is the largest of the Academy's research departments and it maintains one of the important insect and arachnid research collections of the world.

GEOLOGY

Peter U. Rodda, Chairman and Curator. Accession of fossils and Recent shells numbered 3,750 during the year for a total of 53,750 lots. The Geology type collections had 186 accessions for a total of 13,955 specimens. Especially noteworthy were the holotypes of 6 new species of *Ovulidae* (Gastropoda) donated by Mr. Crawford Cate. Other noteworthy accessions include fossil fish and ray specimens from the Green River Shale donated by Mr. Victor J. Bergeron, Pleistocene fossils from the San Pedro area donated by E. P. Chace, and the skull of a fossil elephant from the Union City area, Alameda County, collected by the Department of Geology staff. Accessions to the mineral collection numbered 494 during the year, for a total of 8,894 specimens. Noteworthy were the valuable and beautiful display specimen minerals donated by Mr. and Mrs. L. K. Land and now on exhibit in the new Gem Room in North American Hall, a large aquamarine crystal donated by Mr. Victor J. Bergeron, and a large sulfur specimen from Sicily donated by Mr. C. J. Fraslin.

The Department of Geology received a National Science Foundation Grant of $54,000 to support research in fossil and Recent diatoms, with Dr. Sam L. VanLandingham the principal investigator. The grant, for two years, became effective on May 15, 1973.

Dr. Rodda continues his work on the biostratigraphy and systematics of California Cretaceous Mollusca. Mrs. Jean B. Durham continues her work on lower Cambrian fossils of eastern California. Mr. Allyn G. Smith began a study of the land snails of Chiapas, Mexico, and Dr. Fletcher continued his study of living *Cypraea.* Mr. Chesterman supervised the mineral collection and exhibits and led an Academy members' field trip to the Bridgeport-Bodie area of eastern California.

HERPETOLOGY

Alan E. Leviton, Chairman and Curator. Twenty-four collections with 1,113 specimens were accessioned during the year, and the Academy's collections of reptiles and amphibians contained about 221,000 fully processed specimens and about 5,000 more which have not yet been cataloged. Important additions of the year included 170 from Mauritania and the Canary Islands and 425 from Mexico donated by Field Associate Ted Papenfuss. Field Associate John Gasperetti sent 57 Arabian-Yemen reptiles and amphibians, including at least one new species of lytorhynchid snake, and Scott Maness contributed 58 West African amphibians and reptiles.

Dr. Leviton continued his work on the reptiles of the Arabian Peninsula and the general herpetology of the Southwest Asia as well as revisions of several Philippine snake genera. Mr. Drewes concentrated on the reptiles of northern Kenya. Research Associates Walter C. Brown and Angel Alcala, with support from the National Science Foundation, worked on the tropical fauna of the Philippine Islands. Mr. Ted Papenfuss studied the life histories of the two-legged amphisbaenians of the genus *Bipes* in Mexico, and did field work in Mexico and in the southern Sahara. Dr. Leviton

visited several European collections in June, 1973.

A generous grant from Mr. and Mrs. Daniel E. Koshland enabled the department to purchase a Hewlett-Packard programmable calculator-computer. A second grant, from Mr. and Mrs. Elkan Morris, was to support future field work in North Africa.

ICHTHYOLOGY

William N. Eschmeyer, Chairman and Associate Curator. The preserved fish collection is the second largest in the United States, numbering about 170,000 lots, and its maintenance received $37,000 in support from the National Science Foundation. About 28,000 specimens, representing 2,300 lots, were accessioned; these include a 2,000-bottle collection of California and Baja California fishes presented by Dr. Robert R. Rofen of the Aquatic Research Institute of Stockton, California. Other noteworthy specimens were received from Franz Steiner and from staff members and field associates. Type specimens of 20 new species were deposited in the type collection.

A total of 4355 specimens were loaned during the year, and 90 scientists came to work at the Academy—some on several occasions and for as long as several weeks.

Dr. Eschmeyer continued his National Science Foundation sponsored studies of rockcods with Dr. Lo-chai Chen, and worked on tropical scorpaenid fishes. Several papers on Indo-Australian scorpaenids were completed with Dr. Kaza Rama Rao, an Academy-sponsored visitor from India, during Dr. Rama Rao's three-month stay in San Francisco. Dr. Eschmeyer made several short collection trips off the California coast and one two-week cruise off Oregon aboard the Research Vessel *Yaquina* of Oregon State University, and went to Hawaii to collaborate with Dr. John E. Randall in studies of Hawaiian scorpionfishes.

Mr. W. I. Follett worked on California fishes and fossil fishes remains, and on the list of California fishes with Research Associate Carl L. Hubbs and Mrs. Lillian J. Dempster. Mrs. Dempster continued her studies with Dr. Freihofer on the peculiar blennioid fish *Pholidichthys* and, with Dr. Eschmeyer, on a catalog of scorpionfishes.

Dr. Warren C. Freihofer, with partial support from the National Science Foundation, continued investigations of nerve patterns and their relationship to the phylogeny of fishes.

Dr. Tomio Iwamoto continued studies of grenadier fishes and completed a review of eastern Pacific species with David Stein of Oregon State University. He collected fishes for the Academy on cruises off British Columbia and San Diego, California.

Mr. Leon Hallacher completed his studies of the swimbladders of rockfishes of the genus *Sebastes*.

Miss Pearl Sonoda started a catalog of the type specimens in the Academy's fish collection.

INVERTEBRATE ZOOLOGY

Dustin D. Chivers, Acting Chairman and Assistant Curator. The department's general reference collection of wet preserved invertebrate animals contains more than 40,000 lots and is one of the most important in western North America.

Mr. Chivers was in charge of the department following Mr. Allyn G. Smith's retirement on June 30, 1972. Dr. Welton L. Lee, then on the faculty of Hopkins Marine Station of Stanford University, accepted the position of Chairman and Curator effective July 1, 1973. Mr. Chivers'

Facing page: Fred Funk, Academy taxidermist, explained processes of exhibit preparation to an interested group. Left, during the Open House, Associate Curator of Ichthyology Dr. Warren C. Freihofer was unable to convince young skeptics that sawfishes might saw wood.

guidance of the department through the year, with the assistance of a small staff and volunteers, was well done.

The Invertebrate Zoology Department was activated in 1960. Since then it has become the permanent repository of many important research collections which were accumulated by scientists working at institutions which lacked facilities for the permanent preservation of their research material. The Academy collection has thus become a resource rich in type specimens and historically significant materials, and that resource is available to all students and investigators.

ORNITHOLOGY AND MAMMALOGY

Robert T. Orr, Chairman and Curator. The year ended with 82,331 birds in the collection, and 20,676 mammal specimens; 134 birds and 207 mammals were accessioned during the year. Dr. J. Dan Webster gave 68 mammals and 57 birds from Alaska, Ray Bandar donated 45 marine mammal skulls from Baja California, Jon Winter gave five mammal skulls from Argentina, and the Naval Underseas Laboratory provided 24 marine mammal skeletons from Hawaii. Collecting along local beaches provided the Academy's first northern right whale dolphin, a pygmy sperm whale, an adult male northern elephant seal, and ten other marine mammals.

Dr. Orr continued to serve as Associate Director of the Academy as well as Chairman of the Ornithology and Mammalogy Department. He led Academy members' trips to the bristlecone pine forest in the White Mountains, to East Africa, to Redwood National Park, to Guadalupe Island and Scammons Lagoon, and to the Farallon Islands.

Dr. Orr is secretary of the Pacific Division of the American Association for the Advancement of Science, and attended the AAAS annual meeting in Washington and the Division meeting in Salt Lake City.

Dr. Binford directed the curatorial activities of the staff and volunteers. He remained President of the Board of Directors of the Point Reyes Bird Observatory. His research included continued studies of the avifauna of Oaxaca, Mexico; hawk migration over the Marin headlands; a breeding bird survey for the Department of Sport Fisheries and Wildlife; and the effects of public use of Pescadero Marsh in San Mateo County.

Mrs. Jacqueline Schonewald accomplished much of the curatorial work of the department and, with Lise Thomsen, managed the local collecting and processing of specimens. With the cooperation of Marion Buegler and Karren Hakanson, she started on the final arrangement of the Stanford mammal collection. She also served as technical advisor for the Exhibits Department in the preparation of the cetacean exhibit, tour leader for many groups visiting the department and for two Academy members' trips to the Farallons, and represented the Academy at meetings of the San Francisco Commission of Animal Control and Welfare.

SCIENTIFIC PUBLICATIONS

Edward L. Kessel, Editor; and Diana R. Young, Assistant Editor. A total of 439 pages of scientific literature was published by the Academy during the year—75 pages of Proceedings and 364 pages of Occasional Papers.

The Publication Committee consists of George Lindsay, Chairman; Edward L. Kessel, Paul H. Arnaud, William N. Eschmeyer, and Alan E. Leviton.

STUDENT ASSISTANCE PROGRAM

Alan E. Leviton, Coordinator. Thirty-nine students were employed by the Academy on a part-time basis under contracts with San Francisco State University; University of California, Berkeley; and the University of San Francisco under the E.O.A. work study program of the United States Department of Health, Education, and Welfare. The Academy provided $7720 of the $26,739 received by the students for 10,757 hours of work. Six research departments, the library, aquarium, machine shop, and exhibits department utilized the program.

By providing funds and work opportunity, the Academy directly affected the lives of the participating students by enabling them to remain in school and continue their education while gaining practical experience with opportunities to explore vocational interests and possibilities.

APPLIED RESEARCH

While basic research is the primary purpose of the California Academy of Sciences, applied research, or research related to the solution of a problem or process, is carried on in several fields. Applied research often utilizes the information resulting from basic or pure research. Applied research at the Academy has contractual support.

For some years the Academy has been an active participant in the California Cooperative Oceanic Fisheries Investigation, CALCOFI, which was initiated by the California State Marine Research Committee, and has involved the Academy, the California Department of Fish and Game, the Hopkins Marine Station of Stanford University, the United States Fish and Wildlife Service, and the Scripps Institution of Oceanography.

Initially Dr. Robert C. Miller was designated as chairman of an advisory committee to the Marine Research Committee. It presently appeared that this was growing to a full-time job, and the Marine Research Committee contracted with the Academy for a Research Coordinator. The first occupant of this position was Dr. Garth I. Murphy, now Professor of Oceanography at the University of Hawaii. He was followed by Dr. Marston Sargent, former Oceanographer for the United States Office of Naval Research, who is presently Coordinator.

Under separate contracts, the Academy has employed Dr. Tom Groody, Mr. Norman Grant, Mr. Anatole Loukashkin, and others for specific investigations on the behavior, food, and feeding habits of the Pacific sardine and northern anchovy. Behavior in an electrical field has also been studied, leading to possible new methods of fishing. Mr. Loukashkin is presently engaged in a study of the food of anchovies, Pacific mackerel, jack mackerel, hake and squid. These investigations have been carried out under the general direction of Dr. Robert C. Miller, presently Senior Scientist of the Academy.

The Academy has also been contracted by the United States Bureau of Reclamation, Department of the Interior, to conduct a two-year study of the biology of the 116-mile long Delta-Mendota Canal. The canal, plagued with biological fouling problems for most of its history, has been periodically drained and dredged to maintain delivery capacity. Several years ago the late Dr. G Dallas Hanna, Dr. Robert C. Miller, and other Academy scientists made preliminary investigations of the situation. Then in July, 1972 the Academy undertook a study of the basic biology of the canal, including the species present and their densities and relationships, to establish a base-line understanding essential to the search for a biologically related solution to the fouling problem.

Mr. Larry L. Eng came to the Academy from the Davis campus of the University of California to head up the canal survey under the supervision of Dr. Robert T. Orr. Mr. Eng's research interest is in the biology and population ecology of the Asiatic clam, *Corbicula manilensis,* a dominant organism of the Delta-Mendota Canal. Aiding him in the project was Mr. David W. Behrens who was previously employed in our Department of Ichthyology.

George E Lindsay

GEORGE E. LINDSAY
Director

VOLUNTEERS

During the year many of the Academy's activities were augmented by volunteers who generously donated their time and services. Some assisted in the various departments: typing, cataloging, and performing other necessary tasks, while others served as docents after completing the docent training courses. We are most grateful to the following:

Mrs. Merritt Adelman, Docents
Mrs. Louis J. Amoroso, Docents
Mr. Steven Anderson, Entomology
Mr. Paul H. Anderson, Library and Picture Collection
Mrs. Ruth Andriotti, Taxidermy
Mrs. Mary Anger, Docents
Mrs. Jean Arbuthnot, Docents
Mrs. Paul H. Arnaud, Jr., Entomology
Mr. Julian Arntz, Geology
Miss Lucia Atwood, Docents
Miss Joan Bacharach, Exhibits
Mrs. Lois F. Bailey, Docents
Mrs. Carol Beck, Taxidermy
Mr. Keith Bedard, Entomology
Mrs. Charles Binger, Docents and Taxidermy
Miss Kristin J. Bjornson, Taxidermy
Mrs. Charles P. Blackledge, Library
Mrs. Richard Boede, Docents and Picture Collection
Mrs. Roberta Borgonovo, Docents
Ms. Phoebe Brown, Taxidermy
Mr. Richard M. Brown, Entomology
Mrs. Walther Buchen, Public Information
Mrs. Wallace Burr, Docents
Nicholas Caldararo, Exhibits
Miss Janet Campbell, Taxidermy
Margaret W. Campbell, Library
Miss Anna Maria Christensen, Docents
Mrs. Richard C. Coopersmith, Docents
Mrs. Charles Cowley, Docents
Mr. James B. Cunningham, Delta-Mendota Canal
Mrs. Thomas Curran, Docents
Mrs. Grace Curtis, Public Information
Mrs. Frank S. Davis, Docents
Miss Helen Davis, Entomology and Picture Collection
Mrs. Paula Degroot, Taxidermy
Mrs. Aristedes Demetrios, Docents
Mr. John F. Dodds, Picture Collection
Mrs. Painter Douglass, Entomology and Exhibits
Mrs. E. C. Drescher, Picture Collection
Mrs. Robert Dunne, Docents
Mr. Raleigh Ellisen, Picture Collection
Miss Ella Epstein, Docents
Mr. Henry Erickson, Exhibits
Mrs. Joseph Fenton, Docents
Miss Dawn Fiala, Ichthyology
Mrs. Margie Filcich, Taxidermy
Mrs. Robert Fishman, Docents
Mrs. Duane J. Folz, Docents
Mr. Patrick Fong, Taxidermy
Mrs. Douglas Fraser, Docents
Miss Cynthia French, Geology
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Mrs. Ernest K. Goodner, Docents
Mrs. James Griffith, Docents
Miss Sally Hall, Entomology
Miss Roberta Halpern, Ornithology and Mammalogy
Mrs. Eugene Hammond, Docents
Miss Katherine Hanrahan, Docents
Miss Frances Hanan, Taxidermy
Mr. Richard Hansen, Photography
Mrs. Kevin D. Harrington, Docents
Mrs. John S. Hartwell, Docents
Mr. Christopher Hedman, Geology
Mr. Karl Heisler, Ornithology and Mammalogy
Mrs. Alan Hendin, Docents
Mrs. Glenn Hendrix, Docents
Mrs. Leo G. Hertlein, Geology
Miss Lois Hesson, Docents
Mrs. Barbara Hinds, Taxidermy
Mr. Frederick Hilmer, Docents
Mr. Craig Himmelwright
Mrs. Irving Hochman, Docents
Miss Vivienne Hock, Docents
Mrs. Sheila Holderness, Docents
Mrs. John Hopkins, Docents
Mrs. Thomas Horstman, Docents
Mr. Norbert Hoover, Ornithology and Mammalogy
Mr. Allan Hubbard, Instrument Shop
Mrs. Cecil Iden, Picture Collection
Mrs. David R. Inge, Docents
Mr. Ernest Iverson, Invertebrate Zoology
Mrs. Arthur Jampolsky, Docents
Mrs. Max Janoff, Docents
Miss Elizabeth Jewett, Ornithology and Mammalogy
Mr. Randolph Johnson, Aquarium
Mrs. George T. Kammerer, Docents
Miss Mamie Kamada, Ichthyology
Mrs. Edwin O. Kelsey, Botany
Miss Susan Keating, Ichthyology
Mrs. Roger Ketcham, Picture Collection
Mrs. Don King, Picture Collection
Mr. David Kinstle, Exhibits
Mr. Michael Lampen, Geology
Ms. Eleanor Lawry, Geology
Mrs. William T. Lewis, Docents
Mr. William J. Light, Invertebrate Zoology
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Mrs. Van Lieu, Docents
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Miss Grace Mahoney, Docents
Mrs. James Mailliard, Docents
Mrs. William Mailliard, Jr., Docents
Mrs. Thomas B. Malarkey, Docents
Mrs. Gerald Manerud, Docents
Mr. Theodore Manzano, Ichthyology
Miss Marjorie Maxwell, Development
Mrs. Hilda McAvin, Docents
Mrs. Jean McCauley, Docents
Mrs. Carol McCarthy, Ornithology and Mammalogy
Mr. Ken McCloud, Aquarium
Miss Sybil Renee McGowan, Docents
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Mrs. Joseph A. Moore, Jr., Docents
Mrs. Oral L. Moore, Docents
Mr. Charles Morris, Aquarium
Mrs. John L. Meyers, Docents
Miss Deborah Nelson, Geology
Mrs. M. S. Nickelsburg, Docents
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Ms. Camille Sherman, Taxidermy
Mrs. Frank Silver, Docents
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Mrs. Robert Solomon, Docents
Mr. Craig Stamps, Ichthyology
Dr. Phoebe Sorenson, Herpetology
Mrs. Thomas R. Stand, Docents
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Mrs. Gilbert Tunison, Docents
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Mrs. Francisca Velikoselsky, Exhibits
Mrs. Oscar Weed, Docents
Miss Barbara Weitbrecht, Delta-Mendota Canal
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Mr. Byron Wilson, Aquarium
Mr. Leland Wong, Taxidermy
Miss Yvonne Wong, Delta-Mendota Canal
Mrs. John K. Wylie, Library
Mr. William Zukosky, Exhibits

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(as of June 30, 1973)

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Robert T. Orr, *Associate Director* Earl S. Herald, *Associate Director for the Aquarium**
Dr. William Eschmeyer, *Acting Superintendent for the Aquarium*
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Charles F. Hagar, *Lecturer*
Jose Mena, *Lecturer*
Richard Sanjour, *Lecturer*
Michael A. Bennett, *Lecturer*
Kenneth Adams, *Lecturer*
John W. Hinds, *Lecturer*
Charlotte Patterson, *Cashier*
Karen Gill, *Cashier/Usher*
Ralph Palsson, *Usher*
Matthew Rourke, *Usher*
Jeffrey Turcott, *Usher*
Dwight Yen, *Usher*
Bing Francis Quock, *Usher*
Donna Quammen, *Cashier/Usher*

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Claire Etienne, *Curatorial Assistant*
Anita Noldeke, *Curatorial Assistant*
Thomas C. Fuller, *Research Associate*
Clare B. Hardham, *Research Associate*
Hans Leschke, *Research Associate*
Robert Ornduff, *Research Associate*
Henry M. Pollard, *Research Associate*
Peter H. Raven, *Research Associate*
Lewis S. Rose, *Research Associate*
Gordon H. True, *Research Associate*
Ernest Twisselmann, *Research Associate*
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Larry Eng, *Research Biologist*
David Behrens
Victor Granchukoff, *Curatorial Assistant EOA*

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Pamela Capen, *Secretary*

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Hugh B. Leech, *Associate Curator*
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Vincent F. Lee, *Curatorial Assistant*
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Richard L. Doutt, *Research Associate*
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P. H. Timberlake, *Research Associate*
Joseph Wilcox, *Research Associate*
Stanley C. Williams, *Research Associate*
Elwood Zimmerman, *Research Associate*
Benjamin H. Banta Field, *Field Associate*
Don Patterson, *Field Associate*
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Ian A. Boussy, *Associate*
Robert W. L. Potts, *Associate*

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Margaret Day, *Researcher*
Frederick Funk, *Taxidermist*
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Konstantin Kurkin, *Cabinet Maker*
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George S. Myers, *Research Associate*
Sam P. Welles, *Research Associate*
John Gasperetti, *Field Associate*
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Ted Papenfuss, *Field Associate*

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Bruce A. Kock, *Honorary Curator*

*Deceased January 16, 1973

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Warren C. Freihofer, *Associate Curator*
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Lo-chai Chen, *Research Ichthyologist*
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Beverly Wesemann, *Curatorial Assistant NSF*
Kathy Boyer, *Secretary Assistant*
Elizabeth Javens, *Secretary*
Cherryl Pape, *Secretary Illustrator*
Katherine Smith, *Artist Curatorial Assistant*
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Margaret G. Bradbury, *Research Associate*
Carl L. Hubbs, *Research Associate*
Giles W. Mead, *Research Associate*
George S. Myers, *Research Associate*
Robert N. Lea, *Field Associate*
Daniel J. Miller, *Field Associate*
William Rodgers, *Assistant NSF*

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John Leonberger, *Technician*
Frank Ramirez, *Electrician*
Allan Hubbard, *Printer*
David Lyman, *Technician-machinist*

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Robert C. Miller, *Curator*
James T. Carlton, *Technical Assistant and Associate*
David Coleman, *Technical Assistant*
Hans W. Bertsch, *Research Associate*
Myra Keen, *Research Associate*
C. Carlton, *Associate*
Ralph O. Fox, *Associate*
Ernest W. Iverson, *Associate*
Franz B. Steiner, *Field Associate*

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Darrel McKenzie, *Instructor*
Kevin Ahern, *Instructor*
John Dobson, *Instructor*
William Rogers, *Instructor*
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Mark S. Ghiorso, *Student Instructor*
Brian McCaffrey, *Student Instructor*
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Wayne Palsson, *Student Assistant*
David Silver, *Student Assistant*
Paul Sullivan, *Student Assistant*
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Craig Schiffries, *Student Assistant*
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Andrew J. Bell, *Stationary Engineer*
Walter Franz, *Stationary Engineer*
James Goodheim, *Stationary Engineer*
Ed Fu, *Stationary Engineer*
James Mullhall, *Stationary Engineer*
James Stillwell, *Stationary Engineer*
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Louis Blakely, *Janitor*
Woodrow Brown, *Janitor*
Leonard Burns, *Janitor*
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Nathan Cole, *Janitor*
Eugenio Luis, *Janitor*
Herbert Parnell, *Janitor*
Robert Polk, *Janitor*
Clarence Wise, *Janitor*
Rachael Worthery, *Janitress*
Norris Coleman, Jr., *Janitor Relief*
Emily Mutch, *Janitress Relief*

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Marian Ganapol, *Membership Secretary*
Roberta Pacheu, *Payroll*
Frances McCrann, *PBX Receptionist*
Italo Tulipano, *Service Center*
Marina Balette, *Addressograph Operator*
Sally O'Leary, *PBX Receptionist*

ORNITHOLOGY AND MAMMALOGY

Robert T. Orr, *Chairman and Curator*
Laurence C. Binford, *Associate Curator*
Jacqueline Schonewald, *Senior Scientific Assistant*
Lise Thomsen, *Curatorial Assistant*
Charlotte Dorsey, *Secretary*
John R. Arnold, *Research Associate*
Robert L. Bowman, *Research Associate*
Anatole S. Loukashkin, *Research Associate*
Dorcas E. MacClintock, *Research Associate*
Walter A. Sheppe, *Research Associate*
J. Dan Webster, *Research Associate*
Peter Allen, *Field Associate*
Raymond Bandar, *Field Associate*

PACIFIC DISCOVERY

Bruce Finson, *Editor*
Johan Kooy, *Art Director*

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Maurice C. Giles, *Scientific Photographer*
Lloyd E. Ullberg, *Staff Photographer*

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Paul Anderson, *Associate*
Muriel French, *Associate*

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Hal Richardson, *Information Officer*

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Edward L. Kessel, *Editor*
Diana R. Young, *Assistant Editor*

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Anna Wong, *Cashier*
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Karen Gill, *Cashier*
John Phillips, *Guard*
Levelle Alderson, *Guard*
Otis Chappell, *Guard*
Mike Matulich, *Guard*
David Dippell, *Guard*
James Murphy, *Guard*
Randell Stephens, *Guard*
Chris Hedman, *Relief Guard*
Bruce Herald, *Relief Guard*
Vincent Wharton, *Relief Guard*

SENIOR SCIENTIST

Robert C. Miller, *Senior Scientist*
Camille Sweeney, *Assistant*

EOA ASSISTANTS

Economic Opportunity Act. Work-study student sponsored by the Federal Government Health, Education and Welfare Department through the University of California, Berkeley, California State University at San Francisco, and the University of San Francisco.

STUDENTS EMPLOYED DURING FISCAL 1972-1973:

Gerlinde Ardey-Damoiseaux
Charles Boatman
William Brooks
Angela Brown
Nicholas Caldararo
Carlos Carazo
Diane Chao
Edmond Chow
Robert Churchill
William Cole
Charles Durege
Robert Franklin
Rafael Gallardo
Robert Garrett
Margaret Goodwin
Victor Granchukoff
Patricia Haneline
Thomas Hicks
Michael Hippe
Albert Lee
Harry Lee
Kathleen Lee
William Martisius
Yavonne Mason
Ann McDavitt
Kenneth Miller
John Muzzatti
Kevin Myers
Robert Okazaki
Williard Olson
Cynthia Rapak
Janice Sacherer
Anthony Savage
Gary Shepard
Linda Smith
Suzanne Stockton
June Tracy
Marcia Valladares
Ute Von Doyen
Gladys Wong
Anne Zimmerman

STAFF BIBLIOGRAPHY

1972-73

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—— *Meigenielloides cinereus* (Diptera: Tachinidae) reared from *Gammarotettix bilobatus* (Orthoptera: Gryllacrididae). Pan-Pacific Ent., vol. 49, pp. 82-83.
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CALIFORNIA ACADEMY OF SCIENCES

BALANCE SHEETS — JUNE 30, 1973

	Current Funds					Endowment funds and funds functioning as endowment
	General operating	Restricted to research	Unexpended plant improvements	Building fund	Special purposes	
ASSETS						
Cash:						
Commercial accounts	$11,110	$ 21,587	$ 9,705	$ —	$ 32,716	$ —
Savings accounts	—	—	47,778	3,401	40,319	14,532
	11,110	21,587	57,483	3,401	73,035	14,532
Receivables:						
Pledges (note 8)						
Research grants (note 2)	—	211,801	—	—	—	—
City and County of San Francisco	5,457	—	—	—	—	—
Contracts receivable	23,683	—	—	—	—	—
Other	10,589	—	77	1,594	17,036	23,614
	39,729	211,801	77	1,594	17,036	23,614
Supplies for sale or use (at lower of cost, (first-in, first-out) or market) (note 3)	1,440	—	—	—	—	—
Prepaid expenses	9,870	—	—	—	—	—
Investments (at cost) (note 4):						
Commercial property, including a fully depreciated building	—	—	—	—	—	608,084
Marketable securities	—	—	17,562	125,363	779,134	2,620,149
	11,310	—	17,562	125,363	779,134	3,228,233
Due from other funds	—	12,708	—	14	28,539	2,518
Buildings (note 5)	—	—	—	—	—	—
Collections, library and equipment (note 6)	—	—	—	—	—	—
Unamortized lease commissions (amortized on the straight-line basis over 40 years)	7,666	—	—	—	—	—
	7,666	12,708	—	14	28,539	2,518
Total assets	$69,815	$246,096	$75,122	$130,372	$897,744	$3,268,897
LIABILITIES AND FUND BALANCES						
Accounts payable	20,630	—	1,194	—	—	2,388
Accrued expenses	1,870	—	—	—	—	—
Due to other funds	35,396	—	8,384	—	—	—
	57,896	—	9,578	—	—	2,388
Fund balances	11,919	246,096	65,544	130,372	897,744	3,266,509
Total liabilities and fund balances	$69,815	$246,096	$75,122	$130,372	$897,744	$3,268,897

See accompanying notes to financial statements.

CALIFORNIA ACADEMY OF SCIENCES

STATEMENT OF CURRENT FUND—GENERAL OPERATING REVENUE AND EXPENDITURES

YEAR ENDED JUNE 30, 1973 WITH COMPARATIVE FIGURES FOR 1972

	1973	1972
Revenue:		
Support from the public:		
Corporate contributions	$ 34,930	$ 41,305
Individuals, trusts and private foundations	64,810	61,906
Membership dues	104,317	92,491
Total support from the public	204,057	195,702
Operating income:		
From the City and County of San Francisco for support of operations	590,970	604,336
Fees and grants from others	32,024	12,604
Planetarium	131,335	126,153
Admissions	337,679	337,865
Sales of merchandise	165,154	152,973
Restaurant royalty	59,039	54,234
Other	40,728	49,764
Total operating income	1,356,929	1,337,929
Investment income:		
Rent from commercial building	153,830	136,572
Interest and dividends	113,050	90,339
Total investment income	266,880	226,911
Total revenue	1,827,866	1,760,542
Expenditures:		
Aquarium and museum	714,145	719,002
Departmental research and curatorial activity	405,474	393,182
Planetarium	80,383	75,998
General and administrative	448,291	425,537
Cost of merchandise sales	145,577	141,321
Employees' pension annuity (note 7)	34,677	34,410
Interest	11,094	11,604
Total expenditures	1,839,641	1,801,054
Excess of current operating expenditures over related income and support	$ (11,775)	$ (40,512)

See accompanying notes to financial statements.

CALIFORNIA ACADEMY OF SCIENCES

STATEMENT OF CHANGES IN FUND BALANCES
YEAR ENDED JUNE 30, 1973

	Current Funds		Unexpended plant improvements	Building fund	Special purposes	Endowment funds and funds functioning as endowment
	General operating	Restricted to research				
Balance at beginning of year	$23,694	$195,849	$31,179	$103,541	$777,839	$2,423,702
Additions:						
Current revenue, expendable for research as specified by donor	—	296,123	—	—	—	—
Contributions, grants and appropriations for endowments and special provisions	—	—	59,163	67,719	92,655	776,255
Interest and dividend income	—	—	1,896	7,273	42,374	—
Other	—	—	—	—	17,720	—
Gain (loss) on sale of securities	—	—	211	(1,112)	6,653	77,627
Total additions	—	296,123	61,270	73,880	159,402	853,882
Deductions:						
Excess of current operating expenditures over related income and support	11,775	—	—	—	—	—
To finance expenditures of current funds	—	213,852	—	—	—	—
Indirect costs recovered on research grants	—	32,024	—	—	—	—
Amounts expended for furniture and fixtures	—	—	20,916	44,798	—	—
Other	—	—	5,989	2,251	39,497	11,075
Total deductions	11,775	245,876	26,905	47,049	39,497	11,075
Balance at end of year	$11,919	$246,096	$65,544	$130,372	$897,744	$3,266,509

See accompanying notes to financial statements.

ACCOUNTANTS' REPORT

The Board of Trustees
California Academy of Sciences:

We have examined the balance sheets of the funds of California Academy of Sciences as of June 30, 1973 and the related statement of current fund—general operating revenues and expenditures and statement of changes in fund balances for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the aforementioned financial statements present fairly the financial position of the California Academy of Sciences at June 30, 1973 and the results of its operations for the year then ended, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year except as described in note 1.

San Francisco, California
August 31, 1973

PEAT, MARWICK, MITCHELL & CO.
Certified Public Accountants

CALIFORNIA ACADEMY OF SCIENCES
NOTES TO FINANCIAL STATEMENTS
JUNE 30, 1973

1. Summary of Significant Accounting Policies

The Academy uses the accrual method of accounting with revenue being recorded when earned and expenses when incurred. Government grants are recognized in full when awarded. Gifts of specimens and collections which have no established value are not included in the financial statements.

In order to better present the results of current operations, the Academy now reports current general operating revenues and expenditures in lieu of an overall summary of financial activities and amounts for June 30, 1972 have been accordingly restated.

2. Research Grants Receivable

Grants receivable represent amounts pledged to the Academy for certain operations and for the completion of designated projects in future years. The grants will be collected as expenditures are made by the Academy for the designated project. A summary of grants receivable follows:

National Science Foundation	$164,788
Other governmental agencies	47,013
	$211,801

3. Supplies for Sale or Use

On June 1, 1973, the Academy discontinued over-the-counter sales and sold almost all of the inventory to an outside concession.

4. Investments

Investments are recorded at cost or, if acquired by gift, at their fair market value at the date of acquisition. A summary of the current market value of the marketable securities for each fund follows:

	Book value	Market value
Unexpended plant improvements	$ 17,562	$ 15,939
Building	$ 125,363	$ 121,939
Special purposes	$ 779,134	$ 761,463
Endowment	$2,620,149	$2,552,435

5. Buildings

Under the terms of the Charter of the City of San Francisco, no one other than the City may hold title to buildings on City property. As the Academy facilities in Golden Gate Park were acquired, title was transferred to the City of San Francisco. The buildings, excluding Cowell Hall, were valued at $14,126,000 by independent appraisal in 1968. Cowell Hall was completed in 1969 at a cost of $1,545,000.

6. Collections, Library and Equipment

Collections, library, and equipment are expensed in the year of acquisition. The Academy staff has estimated the replacement cost of collections, library, and equipment to be in excess of $10,000,000.

7. Employees' Pension Annuity

On January 1, 1964, the Academy adopted a pension annuity plan for all regular full-time staff members under the age of 59 as of that date.

Under the provisions of the plan the Academy and the employees each fund one-half of the pension cost. The Academy's contributions are based on 5% of the amount of salary subject to social security tax and 7½ % of the amount of salary above the social security tax base. Total pension expense for the year was $34,677. There is no past service liability, and it is the Academy's policy to fund current pension costs.

8. Pledges Receivable

Pledges for proposed building expansion have not been recorded since governmental approval for construction plans had not been received as of June 30, 1973.

9. Living Trust

The Academy is the ultimate beneficiary under an irrevocable living trust in the amount of $152,097 (market value $138,820). The income of the trust is paid to the grantors and the Academy bears the cost of all trust operations. The assets of the trust are not shown in the accompanying financial statements.

CONTRIBUTIONS

We would like to acknowledge the support given the Academy by business organizations, private foundations and individuals, whose gifts—past and present—have made possible scientific research, curatorial activities, field expeditions, educational programs and public exhibits. Private benefactions have also made possible all of the Academy buildings. Many Academy programs are funded either directly through gifts, grants and bequests, or indirectly through income from endowment and contributed property. Because of this continued private support, the Academy is ranked as one of the leading museum-research-teaching institutions in the country.

CORPORATE & FOUNDATION GIFTS

Alexander & Alexander Inc.
Allen & Dorward
American Can Company
American Potato Co.
American President Lines
Amstar Corporation, Spreckels Sugar Division
Argonaut Insurance Company
Guy F. Atkinson Company
Baldwin & Howell
BAMAC Foundation
Banco di Roma
Bank of America
Bank of America Foundation
Bank of California
Bank of Montreal (California)
Bank of Tokyo of California
S. D. Bechtel, Jr. Foundation
Belvedere Scientific Fund
Bercut-Vandervoort & Company
Birr, Wilson & Co., Inc.
John A. and Ruth C. Blume Foundation
Blyth Eastman Dillon Inc.
John Breuner Company
Robert and Alice Bridges Foundation
E. D. Bullard Company
California and Hawaiian Sugar Company
California Canadian Bank
Caterpillar Tractor Company
Chevron Oil Company
Coldwell, Banker & Company
Columbia Foundation
Malcolm Cravens Foundation
Crocker Bank
H. S. Crocker Co., Inc.
Del Monte Corporation
DiGiorgio Foundation
Dodge & Cox
The Robert Dollar Company
Dome Construction Corporation
Environmental Quality Analysts Inc.
Fairmont Hotel Company
J. C. Fennelly Company
Fibreboard Corporation
Fireman's Fund American Foundation
First Western Bank & Trust Co.
FMC Foundation
Foremost-McKesson, Inc.
Fromm and Sichel, Inc.
General Electric Company
General Steamship Corporation, Ltd.
Golden Gate Disposal Co.
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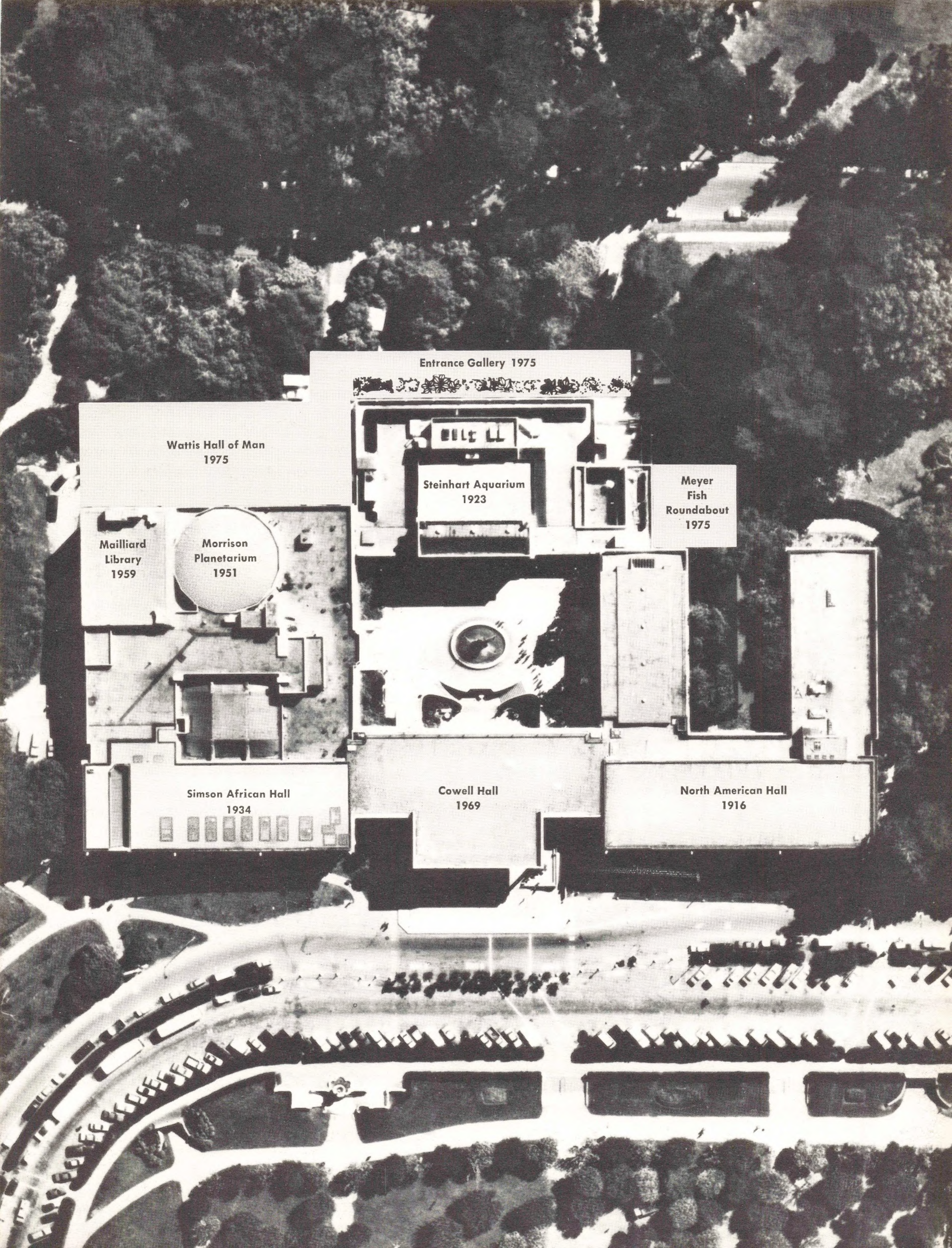
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